Embedded Poles
Embedded Poles

- High dielectric strength without any further external measures
- Optimum protection of the vacuum interrupter from moisture, dust and external damage
- Suitable for different climatic conditions and altitudes of site
- High reliability and long life
Embedded Poles

Easy adaption to circuit-breaker

Maintenance-free

High quality standard

Manufacturing Execution System (MES) enabled

Efficient increase of the dielectric strength without usage of green-house gas
## Embedded Poles

For indoor application (standard)

<table>
<thead>
<tr>
<th></th>
<th>PT1</th>
<th>P3</th>
<th>P4</th>
<th>P4-S</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>VGE4 / VG4 / VG4-S / VGE4-S</td>
<td>12 / 17,5 kV</td>
<td>12 / 17,5 kV</td>
<td>24 kV</td>
<td>125 / 50 kV</td>
</tr>
<tr>
<td></td>
<td>...1250 A</td>
<td>...1600 A</td>
<td>...1250 A</td>
<td>...1250 A</td>
</tr>
<tr>
<td></td>
<td>...31,5 kA</td>
<td>...40 kA</td>
<td>...25 kA</td>
<td>...20 kA</td>
</tr>
<tr>
<td></td>
<td>...95 / 42 kV¹</td>
<td>...95 / 42 kV¹</td>
<td>...125 / 50 kV¹</td>
<td>...125 / 50 kV¹</td>
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<tr>
<td></td>
<td>50.000²</td>
<td>30.000²</td>
<td>30.000²</td>
<td>30.000²</td>
</tr>
</tbody>
</table>

¹ Rated lightning impulse withstand voltage / rated power frequency withstand voltage
² Mechanical operating cycles
## Embedded Poles

For indoor application (high current)

<table>
<thead>
<tr>
<th>PT2</th>
<th>P2</th>
<th>P5</th>
<th>P6</th>
<th>P7</th>
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<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
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<td><img src="image5.png" alt="Image" /></td>
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<tr>
<td><strong>VGE4-S / VG6</strong></td>
<td><strong>VG4-S / VG6</strong></td>
<td><strong>VG4-S / VG6</strong></td>
<td><strong>VG6 / VG8 / VG8-S</strong></td>
<td><strong>VG7</strong></td>
</tr>
<tr>
<td>12 / 17,5 kV</td>
<td>12 / 17,5 kV</td>
<td>24 kV</td>
<td>36 / 40,5 kV</td>
<td>12 / 17,5 kV</td>
</tr>
<tr>
<td>...3150 A&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>3150 A&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>...2500 A&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>...2500 A</td>
<td>...3150 A&lt;sup&gt;1)&lt;/sup&gt;</td>
</tr>
<tr>
<td>...40 kA</td>
<td>...40 kA</td>
<td>...31,5 kA</td>
<td>...40 kA</td>
<td>...50 kA</td>
</tr>
<tr>
<td>...95 / 42 kV&lt;sup&gt;2)&lt;/sup&gt;</td>
<td>...95 / 42 kV&lt;sup&gt;2)&lt;/sup&gt;</td>
<td>...125 / 50 kV&lt;sup&gt;2)&lt;/sup&gt;</td>
<td>...200 / 95 kV&lt;sup&gt;2)&lt;/sup&gt;</td>
<td>...95 / 42 kV&lt;sup&gt;2)&lt;/sup&gt;</td>
</tr>
<tr>
<td>50.000&lt;sup&gt;3)&lt;/sup&gt;</td>
<td>30.000&lt;sup&gt;3)&lt;/sup&gt;</td>
<td>30.000&lt;sup&gt;3)&lt;/sup&gt;</td>
<td>30.000&lt;sup&gt;3)&lt;/sup&gt;</td>
<td>30.000&lt;sup&gt;3)&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

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<sup>1)</sup> 2500 A / 3150 A with heat sink
<sup>2)</sup> Rated lightning impulse withstand voltage / rated power frequency withstand voltage
<sup>3)</sup> Mechanical operating cycles
Embedded Poles
For outdoor application

<table>
<thead>
<tr>
<th>OP0</th>
<th>OP1</th>
<th>OP2</th>
</tr>
</thead>
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<tr>
<td>12 kV</td>
<td>15 / 27 kV</td>
<td>38 kV</td>
</tr>
<tr>
<td>...630 A</td>
<td>...1000 A(^1)</td>
<td>...1200 A(^1)</td>
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<tr>
<td>...20 kA</td>
<td>...16 / 12 kA(^1)</td>
<td>...16 kA(^1)</td>
</tr>
</tbody>
</table>

\(^1\) With integrated current sensor for recloser application
Embedded Poles
Innovative Technology

Schematic diagram

- Upper terminal
- Vacuum interrupter
- Stem
- Lower terminal
- Flexible connection
- Insulated push-rod with contact force springs
- Fixing point
- Connection to drive
Embedded Poles

State-of-the-art manufacturing process

Latest manufacturing methods guarantee process stability and quality at reduced environmental stress

Consistent development of products and processes

Control and monitoring of all essential process parameters

Efficient increase of the dielectric strength without usage of greenhouse gas
Embedded Poles

Quality control

- Verification of dimensional conformity
- Measurement of voltage drop across the pole
- Mechanical function test
- Checking of contact spring force
- Examination by visual assessment
Embedded Poles
Applications as core components

The applications as core components include

- Power plants
- Transformer substations
- Chemical industry
- Steel industry
- Automobile industry
- Airport power supply
- Shipbuilding
- Power supply to buildings
Vacuum Interrupters and Embedded Poles from ABB

Our values for the customer

**Quality & Support**
- Individual customer solutions and support (e.g. short leadtimes)
- Full access to technical competence and test labs (e.g. type test support)
- Dedicated customer support for day-to-day issues

**Reliability & Performance**
- Latest production and extended quality methods with high degree of automation (e.g. series X-ray check)
- Benefit from the large production volume (global supplier base with full risk management)
- Proven in all ABB vacuum products

**Innovation**
- Innovations on ABB components give competitive advantages for our partners
- Full in-house contact production and material control (z.B. batch-wise real-life making/breaking tests)
- Full access to latest embedding technologies